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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/522,832 03/10/00 SAWAZAKI

K PMS 257760

000909
PILLSBURY WINTHROP LLP
1600 TYSONS BOULEVARD
MCLEAN VA 22102

MM91/0829

EXAMINER

BAUMEISTER, B

ART UNIT

PAPER NUMBER

2815

DATE MAILED:

08/29/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
09/522,832

Applicant(s)
Sawazaki et al.

Examiner
William Baumeister

Art Unit
2815



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Jun 29, 2001
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 4-6 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 4-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☐ All b) ☐ Some* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- *See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892) 18) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 19) ☐ Notice of Informal Patent Application (PTO-152)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____ 20) ☐ Other:

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DETAILED ACTION

Drawings

1. Figure 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g).

a. In the REMARKS associated with Amendment A, filed 6/29/2001 (paper #7), Applicants' attorney has alleged that "[the device of Figure 2 is not prior art, but rather] is a part of Applicants' in house technology, and represents an improvement over the Applicants' previous work that does not constitute prior art under 35 U.S.C. § 102."

b. First, the Examiner notes that when an applicant states that something is prior art, it is taken as being available as prior art against the claims, regardless of whether it falls within any of the specific provisions of 35 USC § 102. *In re Nomiya*, 509 F.2d 566, 184 USPQ 607, 610 (CCPA 1975). See also MPEP § 2129. Thus, the issue is not whether Figure 2 and the associated discussion constitutes prior art under 35 USC § 102. Rather, the issue is whether applicants have admitted that this material is prior art by filing the application wherein they repeatedly employ the terms "conventional art" and "background art."

c. Applicants are required to file an affidavit per 37 C.F.R. § 132 providing sufficient evidence that either (1) the disclosure of the subject matter associated with FIG 2 as "conventional" and "background art" was in error, or alternatively (2) that these terms were, in fact, intended at the time of filing to mean "conventional in-house technology," which was not publicly disclosed (see MPEP §716). The arguments of counsel cannot take the place of evidence

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in the record (see “ATTORNEY ARGUMENTS CANNOT TAKE THE PLACE OF EVIDENCE,” MPEP §716.01.(c))

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1 and 4-6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a. Claim 1 recites the limitation "the thickness" in line 7. Since the claim previously sets forth thicknesses for both the clad and the barrier layers, there is insufficient antecedent basis for this limitation in the claim. The examiner provisionally presumes “said thickness” is intended to mean “said thickness of the n-type clad layer,” but confirmation by appropriate amendment is required.

b. Claim 1 recites the limitation “wherein said n-clad layer is formed of material substantially the same as said barrier layers.” It is unclear what meaning is to be attributed to the word “substantially.” For example, this term could mean (1) that the clad and the barrier must be composed of the same material, but may be differently doped; (2) that both are composed of the same ternary compound (e.g., InGa_N), but that they may have different In:Ga ratios; or (3) that

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both materials must merely be III-N materials. Thus, one of ordinary skill in the art would not be apprised of the objective metes and bounds for which applicant seeks protection.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

5. Insofar as definite, claims 1 and 4 are rejected under 35 U.S.C. 102(e) as being anticipated by Kiyoku et al. '010. Kiyoku discloses III-N-based LDs having MQW superlattice active regions 215 sandwiched between light guide (or "clad") regions 214/216 (see e.g., FIGs 10-12). The reference discloses that the n-type light guide layer 214 may be composed of GaN and have a thickness in the range of 100 angstroms to 5 microns (col. 22, line 20). The active region wells and barriers may be composed of InGaN and GaN, respectively (e.g., col. 22, lines 51-; col. 29, lines 14-) and have thicknesses of 25/50 angstroms for the wells/barriers, respectively (col. 29, lines 140-). Accordingly, the light-guide layer is necessarily thicker than and may be composed of the same material as that of the active region barriers. Regarding claim 4, the opposite side of light-guide layer 214 is formed in contact with clad (intermediate) layer 213.

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6. Insofar as definite, claims 1 and 4-6 are rejected under 35 U.S.C. 102(e) as being anticipated by Nakamura et al. '307. Note for example FIGs 3-5 wherein a MQW active region 16 is adjacent to n-type region 201 which is formed of a material having a larger band-gap than that of the active region (clad region) and having a thickness of < 500 angstroms. The barrier layers or the active region are disclosed as having a thickness of about 50 angstroms (col. 14, lines 42-51). Also, an intermediate layer 402 is adjacent to the clad region 401 and is recited as being able to be composed of $\text{In}_k\text{Ga}_{1-k}\text{N}$ ($0 \leq k \leq 1$) (col. 10, lines 45-50).

a. Applicant has argued that Nakamura does not anticipate the present claims in light of the amendment to claim 1 now setting forth that the "n-clad layer is formed of material substantially the same as said barrier layers." (REMARKS, amendment A, filed 7/7/2001) The Examiner does not agree with this assertion. While the embodiment of FIG 5 depicts the tunnel clad layer 201 as having a larger band gap than that of the barrier, and the disclosure states that it is most preferable if the tunnel layer is an AlGaN ternary mixed crystal (e.g., col 10, lines 15-), the disclosure is not so limited. Nakamura only requires that the n-side semiconductor layer 201 ("n-type clad") have a band gap energy larger than that of the active region's *well* layers (e.g., col. 10, lines 10-14). This includes band gaps which are the same as the barrier layer (the barriers and tunneling clad being of the same material). Accordingly, the claims are still anticipated by Nakamura et al.

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Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1 and 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicants' admitted prior art, and further in view of Nakamura et al. as applied to the claims above. Applicants' conventional FIG 2 discloses all of the limitations of the claims except for the n-type clad layer being thicker than the barriers. Nakamura teaches III-N LDs having an "n-type clad layer" 201 which is thicker than the barrier layers. It would have been obvious to one of ordinary skill in the art at the time of the invention to increase the thickness of the n-type clad layer 15 of FIG 2 for the purpose of increasing carrier confinement in the active region as taught by Nakamura et al.

Response to Arguments

9. Applicant's arguments filed 6/29/2001 have been fully considered but they are either moot in light of the new grounds of rejection or are not persuasive for the reasons set forth herein.

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Conclusion

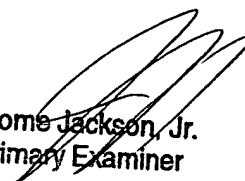
10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

INFORMATION ON HOW TO CONTACT THE USPTO

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to the examiner, **B. William Baumeister**, at **(703) 306-9165**. The examiner can normally be reached Monday through Friday, 8:30 a.m. to 5:00 p.m. If the Examiner is not available, the Examiner's supervisor, Mr. Eddie Lee, can be reached at (703) 308-1690. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956.

B. William Baumeister
August 25, 2001


Jerome Jackson, Jr.
Primary Examiner